# 5. APPLICATION ARCHITECTURE

| IT Direction | | | |
|---|---|---|---|
| Business Architecture | Information Architecture | Application Architecture | Infrastructure Architecture |
| Security Architecture | | | |
| Enterprise Architecture Management (EAM) | | | |

## 5.1 Overview

The Application Architecture identifies and defines the applications that are used to support information defined in the Information Architecture and the business functions and processes defined in the Business Architecture. The Application Architecture is *not* a specific design, nor is it a detailed requirements analysis. It is a definition of what applications provide functionality that supports the defined business functions.

Applications are the mechanisms for managing the data of the enterprise: providing the right information at the right time and place to the right people as needed to support the business processes. The applications enable the IT function to achieve its mission, that is, to provide access to essential data in a useful format at an acceptable cost.

The Application Architecture element identifies the portfolio of application functionality that is needed to support the business functions and processes from the Business Architecture and maps it to business application systems and business information. This will provide input to the specification and design of the technical applications and data needed to support their execution.

## 5.2 Purpose

The purpose of the Application Architecture is to:

- Document the applications used by or needed by the enterprise.

- Establish relationships and dependencies between the applications and the different types of information used, the organizations that use them and business functions/processes that are dependent on them.

- Support technology selection and establishment of policies for the implementation and management of applications in the enterprise

## 5.3 Evergreening

This section represents the first phase of Application Architecture development. This architecture will eventually tie to the Business Architecture that is currently being developed. Moving forward, the Application Architecture will grow to include several components that

describe the applications needed, what business functions they support, the information that applications use, where the applications need to be accessed and how applications should be deployed to best support the business of the enterprise. The following elements will be included in the Application Architecture as it evolves:

- Application Portfolio

- Application to Core Capability Matrix

- Application to Organization Matrix

- Application to Information Matrix

- Application Location and Usage Map

- Application Flowchart

- Application Blueprint

- Application Systems Model

- Application Component Structure

- Application Selections

- Application Allocations

- Application Implementation Designs

## 5.4    Application Portfolio

The purpose of the Application Portfolio is to identify the actual applications currently used or expected to be used to support SFA's business functions and to describe applications as needed to determine their value to SFA and their dependencies on information and infrastructure components. Exhibit 5-1, SFA To-Be Application Portfolio outlines the names and general descriptions of applications to be purchased, licensed, or developed for future use by SFA (and the relationship to any existing applications).

Further details about SFA systems are contained within the Legacy System Inventory Report, Deliverable 16.1.1 (June 9, 2000)

**Exhibit 5-1:  SFA To-Be Application Portfolio**

| Acronym | System Name | General Description |
|---------|-------------|---------------------|
| CBS | Campus Based Programs System | Processes applications for funds in the Federal Perkins Loan, work-study and Supplemental Education Opportunity Grant Programs. The Processing includes correction processing, allocation and accounting processing, non-expended balances and |

| Acronym | System Name | General Description |
|---|---|---|
| | | reallocations, teacher cancellation payments and end-of-year closeouts. The system also processes award letters and obligates funds to institutions. It provides funds directly to participating schools per a statutory formula. |
| CPS | Central Processing System | Computes an applicant's eligibility for Title IV SFA. CPS receives the application data from the MDE contractors and transmits processed data back to the MDEs. The Student Aid Report (SAR) is printed and sent back to the applicant. Aid includes Pell Grants and FFEL student loans. It performs matches against IRS, SSA and INS databases, produces summary data for States and institutions, supports Electronic Data Exchange (EDE) and Integrated Student Aid Management System (ISAMS),and calculates Estimated Family Contribution. CPS receives more than 10 million applications & correspondences annually. |
| | Data Warehouse | Centralized collection of data from various ED/SFA Network System and DBMS. The Data warehouse consists of enterprise-wide information over multiple subject area and contains low-level, granular data, keep over long periods of time for historical reporting purposes. |
| DCS | Debt Collection System | The DCS is the largest component of the FFEL Project. This system consists of 21 subsystems that support assignment, collection activity, record maintenance and reporting of various outstanding debts. |
| DLCS | Direct Loan Consolidation System | DLCS supports ED's Federal Direct Loan Program. It allows borrowers to consolidate multiple student loans from multiple sources into one direct loan, funded and serviced by ED. It provides mechanisms to convert DL and FFELP originated loans into DL loans. |
| DLOS | Direct Loan Origination System | DLOS is the initial entry point for new student loan information into the DL. DLOS receives and processes all loan applications and disbursements and records the receipt of the completed promissory note. It provides the principle communication link with the schools to regulate the flow of information. |
| DLSS | Direct Loan Servicing System | DLSS services Direct Loans while borrowers are in school, in deferment status, or in repayment. DLSS receives all booked student loans from DLOS and maintains them for their remaining life. It performs functions including placing the loan into repayment at the proper time, billing the borrower and tracking subsequent payments and delinquencies. |
| EDExpress | EDExpress | A microcomputer-based software package distributed by ED to schools to support aid packaging, Federal Pell Grant and Direct Loan origination, Student Status Confirmation Reporting (SSCR) and draw-down of data for use by schools. |
| | E-Servicing | Provides electronic servicing functionality |
| FFELP | Federal Family Education Loan | Provides program management, payment of federal reinsurance on defaulted loan claims submitted by guaranty agencies and |

| Acronym | System Name | General Description |
|---|---|---|
| | Education Loan Program | on defaulted loan claims submitted by guaranty agencies and collections on defaulted loans by GAs. Supports collection process for federally guaranteed loans: receives defaulted loan data from GAs; interfaces with external systems, agencies and contractors for skip tracing; produces dunning notices; provides on-line support for collection agents; interfaces with private collection agencies; sets up loan repayment schedules; produces loan payment notices; and tracks receipts. |
| GAPS | Grants Administration and Payments System | The Grant Administration and Payment System supports two mission critical components of the Direct Loan Program. Primarily, GAPS is used to track [funds] drawdown information. Loan Origination and Consolidation systems provide GAPS with information regarding the drawdown of funds for new loans.  The Loan Consolidation System provides a monthly summary record, while the Loan Origination System tracks and reports drawdowns at a schools level.  GAPS compiles there records and communicates with the US Treasury systems. GAPS is also charged with expenditure reporting to the federal government.  It tracks obligated funds (such as Pell Grants, Campus based) against actual expenditure and provides reconciliation to congress. |
| IFAP | Information for Financial Aid Professionals | The Information for Financial Aid Professionals (IFAP) web site (http://ifap.ed.gov) is an electronic library for financial aid professionals containing publications, regulations and guidance regarding the administration of the Title IV Federal Student Financial Aid Programs. |
| MDE | Multiple Data Entry | Provides key entry and other automated and manual functions associated with  SFAP application processing. |
| NSLDS II | National Student Loan Data System | Central verification system that determines eligibility of Title IV aid applicants with respect to prior aid received.  Provides a comprehensive student loan database and a database of lender, school, GA and Federal direct loan program servicer profile data. Improves the quality and accessibility of  student loan data and eases the burden on institutions administering Title IV loan programs and improves the efficiency of data transfer.  While most of the original functionality associated with NSLDS will remain intact, the new version of this system is intended to utilize modernized processes and support enhanced interfaces. |
| OCTS | Ombudsman | This system will facilitate case tracking for SFA. |
| | Oracle Financial | Provides software and hardware for federal financial management system to track funds across all units and provides metrics / cost savings |
| PMS | Payment Management Service | The Payment Management System is operated by the Payment Management Service and Reporting Unit.  The Unit processes payment requests, award updates, adjustments, recipient |

| Acronym | System Name | General Description |
|---------|-------------|---------------------|
| | Service | expenditure data, corrects data that has been rejected by the system and oversees the FEDWIRE process. |
| PEPS | Post-secondary Education Participants System | To provide a management information system with consistent and reliable data and flexible reporting concerning post-secondary institutions, accrediting bodies, state licensing agencies, lenders and guarantors, for a large number of users with diverse business needs. |
| RFMS | Recipient & Financial Management System | To generate obligation information and to monitor grant funds at both the institution and the recipient level. It does this by performing the following functions: authorize the distribution of funds through the participating institutions to permit payment of vouchers; monitoring the use of fund throughout the award year to permit reallocation of supplemental awards as necessary to correspond with student attendance; to verify institutional expenditures through comparing disbursements reported at the recipient level; by responding to informational requests from institutions, recipients and others; and by defining, collecting and reporting data to assist in the evaluation of the Pell Grant program and in projecting future needs. |
| SSIG | State Incentive Grant | ED/SFA/PTAS maintain a PC-based system that administers the SSIG program. This includes receiving application letters from states each year and calculating the allocation of SSIG funds that they should be allotted. States must also report annually on expenditures. |

## 5.5    Application to Core Capability Matrix

The Application to Core Capability Matrix depicts the expected future relationship between SFA's Core Business Applications and the Core Business Capabilities that are primary and central to achieving "best-in-business" results in the areas of customer satisfaction, lower unit cost and employee satisfaction. These capabilities were recently detailed in the Capability Release Plan.  The Application to Core Capability Matrix provides essential information for defining the application, systems management and infrastructure architectures.

The purpose of this matrix is to establish functional ownership for the enterprise's applications and to achieve consensus on which functions are supported by which applications so that the resulting architecture can ensure access to and adequate support for those applications

In Exhibit 5-2, SFA To-Be Application to Core Capability Matrix, the first column lists the SFA Applications from the Application Portfolio and the top row contains the Core Business Capabilities.  The intersections of the rows and columns are marked if a relationship exists or is expected to exist in the target architecture.

**Exhibit 5-2: SFA To-Be Application to Core Capability Matrix**

| Applications | Core Capabilities | | | | | |
|---|---|---|---|---|---|---|
| | Aid Awareness | Aid Application | Aid Origination & Disbursement | Loan Repayment | Loan Consolidation | Financial Transactions |
| Campus Based Programs System (CBS) | ✓ | ✓ | ✓ | ✓ | | |
| Central Processing System (CPS) | | ✓ | ✓ | | | |
| Data Warehouse | | ✓ | ✓ | ✓ | | |
| Debt Collection System (DCS) | | | | ✓ | | ✓ |
| Direct Loan Consolidation System (DLCS) | | | | ✓ | ✓ | ✓ |
| Direct Loan Origination System (DLOS) | | | ✓ | | | ✓ |
| Direct Loan Servicing System (DLSS) | | | ✓ | ✓ | ✓ | ✓ |
| EDExpress | | ✓ | | | | |
| E-Servicing | | | ✓ | ✓ | ✓ | ✓ |
| Federal Family Education Loan Program (FFELP) | | | | ✓ | | ✓ |
| Grant Administration and Payment System (GAPS) | | | | | | ✓ |
| Information for Financial Aid Professionals (IFAP) | ✓ | ✓ | | | | |
| Multiple Data Entry (MDE) | | ✓ | | | | |
| National Student Loan Data System (NSLDSII) | | | ✓ | ✓ | ✓ | |
| Ombudsman Case Tracking (OCTS) | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Oracle Financial | | | | | | ✓ |
| Payment Management System (PMS) | | | | | | ✓ |
| Post-secondary Education Participants System (PEPS) | | ✓ | | | | |
| Recipient & Financial Management System (RFMS) | | ✓ | | ✓ | | ✓ |

## 5.6    Application to Organization Matrix

The Application to Organization Matrix relates the organizations of SFA to the applications that support them.  The Application to Organization Matrix provides essential information for defining the application, systems management and infrastructure architectures.

The purpose of the Application to Organization Matrix is to establish organizational ownership for the enterprise's applications and to achieve consensus on which organizations are supported by which applications so that the resulting architecture can ensure access to and adequate support for those applications.

Exhibit 5-3, Application to Organization Matrix documents the relationships between SFA Applications and the three SFA Organizational Channels:  Student Services, School Services and Financial Partner Services.

**Exhibit 5-3: Application to Organization Matrix**

| Applications | Organizational Channels | | |
| --- | --- | --- | --- |
| | Student Services | School Services | Financial Partner Services |
| Campus Based Programs System (CBS) | ✓ | | |
| Central Processing System (CPS) | ✓ | ✓ | |
| Data Warehouse | ✓ | ✓ | |
| Debt Collection System (DCS) | ✓ | ✓ | ✓ |
| Direct Loan Consolidation System (LCS) | ✓ | ✓ | |
| Direct Loan Origination System (LOS) | ✓ | ✓ | |
| Direct Loan Servicing System (DLSS) | ✓ | ✓ | ✓ |
| EDExpress | ✓ | ✓ | |
| E-Servicing | ✓ | | |
| Federal Family Education Loan Program (FFELP) | ✓ | | |
| Grants Administration and Payments System (GAPS) | ✓ | ✓ | ✓ |
| Information for Financial Aid Professionals (IFAP) | ✓ | ✓ | ✓ |
| Multiple Data Entry (MDE) | ✓ | ✓ | |
| National Student Loan Data System (NSLDSII) | ✓ | ✓ | ✓ |
| Ombudsman (OCTS) | ✓ | | |
| Oracle Financials | | | ✓ |
| Payment Management Service (PMS) | | | ✓ |
| Post-secondary Education Participants System (PEPS) | ✓ | ✓ | |
| Recipient & Financial Management System (RFMS) | ✓ | ✓ | ✓ |
| Intranet | ✓ | ✓ | ✓ |

## 5.7 Core Business Application Flowchart

The Core Business Application Flow Chart depicts the flow of information among the significant applications within. It shows the interdependencies among the applications used by the enterprise and provides essential information for consideration when determining how to partition and distribute applications

The Core Business Application Flow Chart contains a node for each significant application used in the enterprise Flow among the various application nodes indicate the transfer of specific types of information

**Exhibit 5-5: Core Application Flow Chart**
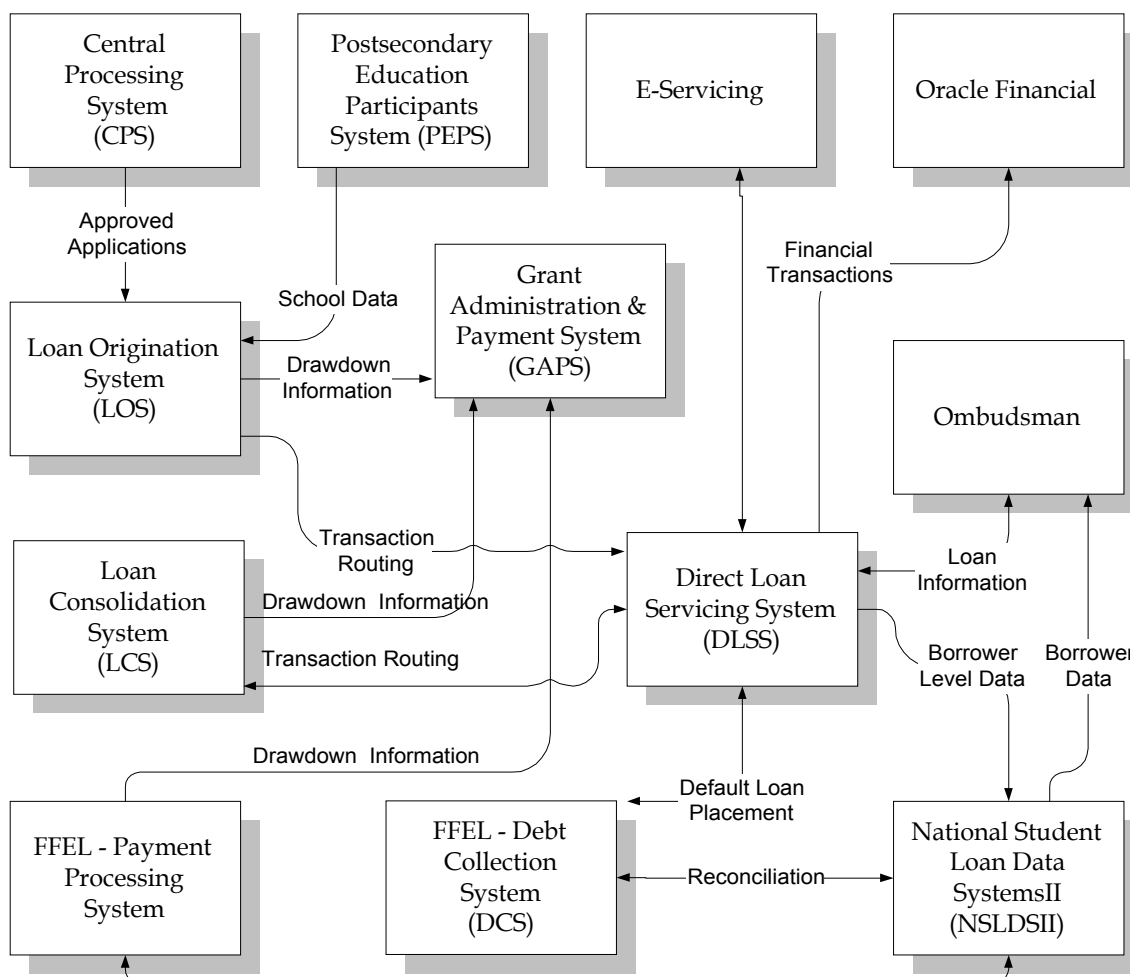


## 5.8 Application Guiding Principles

Application Architecture Guiding Principles provide a framework of guidelines, standards, recommended (best) practices and polices which may be used to manage system design, construction and implementation.  While, in general, these principles may be applied to any application development environment, the Modernization Partner has captured the essence of SFA's core business capabilities into this subset of guiding principles.

The overriding objective of these guiding principles has been to establish a technological architecture which is aligned and dedicated to supporting the business needs of SFA as it is documented today.  Additionally, these guiding principles are intended to encourage a flexible infrastructure capable of adapting to the evolving needs of the business in the future.

Application architecture guiding principles are intended to assist decision makers chart a unified and logical course of action when faced with a volatile operating environment of

changing legislation, budgetary constraints, competing resources and condensed delivery timeframes. They also provide a set of rules to assist in the reaching of decisions in an environment where decision makers may be changing. Guiding principles will attempt to impose some level of consistency across the organization.

Guiding principles in an environment dominated by multiple standards, competing resources and complicated contractual obligations and partners will allow the SFA to steer IT development projects and end-state application architecture in a uniform and consistent direction.

Implementation of these guidelines and standards in an existing IT infrastructure requires a great deal of commitment and a strategy for ongoing governance. Current system architecture as well as operations may not adhere to all document guidelines. For every instance where these guiding principles should be applied, there will be a reason not to. They require c A conscious decision must be made as to when guiding IT principles are to be mandated. Certain systems or projects may be waivered intentionally so that they are exempt from documented guidelines.

The purpose of the guiding principles is to

- Identify and prioritize the most significant factors of the application architecture

- Ensure the application architecture is optimized around those factors that are of most value to the enterprise

- Provide guidance for the design, development and implementation of individual system solutions

## Guiding Principle

The architecture of all applications must support the stated business requirements of SFA.

*Significance*

The enterprise architecture and standards will be designed to:

- Support and optimize the operations of SFA;
- Be highly flexible to accommodate future business changes; and
- Help ensure the overall success of the SFA business.

*Implications*

Information technology can provide SFA with a set of tools and an enterprise information technology environment required to maintain a competitive advantage in today's business world. To positively impact the business, it is critical that SFA implement information technology that measurably improves the business and its processes. SFA must not implement technology simply because it is available.

*Architectural Impact*

The Information Technology Architecture will be able to link information technology to the business functions as required by the Clinger-Cohen Act of 1996.

System designers must have a comprehensive understanding and appreciation of the business requirements of SFA. Training will play an important role in this arena. Staffing decisions and team composition criteria also must continuously focus on ensuring that designers of systematic solutions complement their contribution with the business needs of the organization.

IT investments will be directly linked to business needs, ensuring optimal investments and following SFA's cost/benefit preferences -- investments will be customer focused and aligned with SFA's strategic business goals.

## Guiding Principle

An enterprise wide commitment to periodic application architecture review, alignment and enhancement.

*Significance*

Technology and business strategies both change rapidly. There must be a well defined process in place for these changes to be reflected in SFA's application architecture to ensure the continual alignment of both the organization and the technology. Reviews and revisions must be made as often as SFA or its contracting partners believe necessary to guide the design and development of application and infrastructure systems and components. This allows the maximum opportunity for gains and leverage in the information environment. Dead-end technology is costly to operate and maintain.

*Implications*

- If changes in the business or technology require changes in architecture principles and/or standards, these changes will also be made.

- Technologies and standards will be retired when they are no longer useful to SFA or its future plans.

- Maintenance of the architecture will require staff resources, a strong configuration management process and software tools.

- Organizational entities with the responsibility for managing and updating the architecture must be identified.

*Architectural Impact*

Refreshing the architecture will require skilled professional resources on a regular basis.

Architecture refreshment will provide SFA with a current enterprise architecture to discipline information technology decisions.

## Guiding Principle

Applications in support of SFA's stated business objectives should be developed within an Enterprise-Wide framework.

*Significance*

The various business programs at SFA are reliant upon a variety of system applications supported by various contracting partners. Development standards, internal procedures and even contracting vehicles encourage independent system development methodologies and a duplication of functionality.

Instead SFA and its contracting partners must widen their horizon and look at applications as enterprise-wide assets capable of fulfilling functionality across contractual lines. A system developed by one organization may possess the data and the ability to perform tasks assigned on another contract. Re-developing similar functionality is cost inefficient and leads to maintenance problems.

*Implications*

Optimize resource utilization while eliminating redundant application development.

Encourage the cultural and contractual changes necessary to support an enterprise-wide application development model.

Establish a central application catalogue where high-level system functionality is detailed. This may be used to determine the best-fit system to address new business requirements.

*Architectural Impact*

New systems under development must incorporate technological flexibility through parameterization and use of open and standard development techniques rather than custom applications that are more dependent on in-house expertise.

New applications under development must adhere to a set of common and generally accepted standards.

*Guiding Principle:* Use of Commercial/Government Off-The-Shelf solutions

*Significance*

Preference will be given to acquiring Commercial off-the-shelf (COTS) or Government-off-the-shelf (GOTS) software products in lieu of developing custom application solutions to business

requirements. COTS and GOTS products can range in size and functionality from component functions that plug into existing systems infrastructure, to entire application systems, to enterprise resource systems. Industry trends toward increased software development costs are likely to continue instead of abate and the appropriate use of COTS and GOTS products is one way to acquire needed IT capabilities in a cost-effective manner. Where using existing components is both possible and feasible, it is no longer acceptable for Federal agencies to specify, build and maintain comparable custom solutions.

*Implications*

This guiding principle will assist the SFA in enhancing its business and mission effectiveness by exploiting technology solutions that are widely available to customers, partners and stakeholders.

COTS / GOTS could potentially reduce the burden of software development and reduce the risk of introducing new functionality into existing systems.

Support for COTS / GOTS in more likely to be universally available than that of custom software. This support will include not only technical support, but upgrades and new releases.

SFA through the volume of its system development resources may be able to apply some leverage in securing COTS/ GOTS solutions.

*Architectural Impact*

The ITA must support the use of COTS and GOTS packages.

The ITA should attempt to identify common components across the various systems. These common components are [more] likely to be supported by existing COTS / GOTS solutions. For example accounting modules, form printing modules, query and reporting modules.

**Guiding Principle**

SFA and its contracting partners to adopt Open Systems Standards

*Significance*

Open systems standards provide the best means of developing applications such that both the design and system implementation are independent of a specific vendor's hardware or software platforms. Products and technologies that are considered compliant with open systems standards use interface specifications that are readily available to all suppliers, service providers and users and are revised only with timely notice and public process. Open systems standards allow for continued access to technological innovation supported by many customers and a broad IT industry base.

*Implications*

This guiding principal is intended to allow the SFA to easily adapt technology solutions to satisfy changing business requirements while lowering the total cost of IT ownership.

Contractor relationship should be given incentives to promote use of open system in favor of custom (closed) solutions.

Where possible SFA should avoid implementing proprietary IT solutions unless they are key to providing critical business functionality and no acceptable standard and/or product alternatives exist.

*Architectural Impact*

The ITA must be flexible enough to accommodate the existing inventory of "Closed" systems yet allow for the inclusion of "open" system architecture as and when they become available.

The ITA must be used as a tool for identifying commonalties across "Closed" systems and thus candidates for "Open" system alternatives.

**Guiding Principle**

Design and Develop Application Software Components for Reusability

*Significance*

This principle emphasizes two main characteristics of open systems standards. Designing application software as components of an overall system and designing components for reusability. Together, these concepts constitute the minimum requirements for designing and deploying adaptable IT solutions that are capable of evolving with the business needs.

*Implications*

Increase applications development productivity and responsiveness to business needs while reducing complexity and enhancing functional and technical systems integration by using modular design components.

Expand reusability beyond sharing code to sharing business processes, system designs, tools, training and documentation.

Where possible SFA and its contracting partners should utilize existing standards and thus enhance compliance across trading partners. For example standards developed by NACHA may be used in developing electronic transmission of financial data.

*Architectural Impact*

Plan for migrating applications development methods to employ tools and techniques that facilitate sharing and reuse.

Identify the reusable portions of application logic as distinct from logic specific to particular business processes.

Establish and maintain a library of reusable, shareable components.

Establish interface standards for sharing reusable components.

Develop an architecture model that specifies a layered, modular application design structure.

## Guiding Principle

Promote the Use of Web-Based Technology

*Significance*

The Internet and its related web-based technologies are the most significant advancements in information systems to occur in the last few years. Using the Internet, Intranets and Extranets offer new channels for enhanced communications directly between customers and borrowers. Where feasible, SFA and its contracting partners must incorporate the use of web-based technologies (i.e., the Internet, Intranets and Extranets) in designing and deploying IT solutions to support SFA program needs.

*Implications*

Enhanced information dissemination to customers, borrowers, schools and other stakeholders.

Ability to reduce costs by reducing the need to support routine customer inquiries through human interaction.

Ability to provide a variety of web-based services that reduce mailing time, mailing costs and inefficiencies associated with human intervention. These include online forms, screens that allow routine demographic changes, access to accounts and ability to review account history on the web.

Ability to provide additional links to accommodate new systems or additional information as it becomes available.

*Architectural Impact*

The existing system inventory in the ITA should be the starting basis for identifying candidate systems for web-based developments.

The security component of the ITA must address the various challenges inherent in providing web-based access to such critically sensitive data.

**Guiding Principle**

SFA will proactively plan for the enhancement and retirement of business applications and infrastructure, while requiring re-usability in newly developed systems.

*Significance*

SFA must proactively plan for technology obsolescence.

SFA must understand the business strategy in order to actively plan for technology obsolescence.

SFA's contractors must plan for reusability and parameterization of newly developed systems.

*Implications*

An IT planning process must be in place and tied tightly to the business planning process.

SFA must have a forward-looking technology assimilation process in order to effectively plan for the future IT environment.

IT assets should be depreciated more aggressively in order to take advantage of emerging technology solutions.

*Architectural Impact*

Systems with high operational costs will be candidates for replacement.

SFA's architecture will support legacy systems that are aligned with the long term strategic direction of the organization. The architecture may provide minimal or no support for some current systems if that support would result in a high-maintenance situation.

The development environments will use languages, tools, processes and methodologies designed to simplify the support of applications and architectures throughout their life-cycles.

Architectural components will be designed for reuse in order to minimize the cost of developing new systems.

Application and infrastructure releases will follow a release schedule to enable better planning.

**Guiding Principle**

To provide support for common enterprise systems, SFA should establish and enforce infrastructure standards as well as fund and deploy those standards at the enterprise level.

*Significance*

Contractors will be required to adhere to a common enterprise infrastructure.

While business requirements will be the driver of IT projects, this guiding principal will provide structure to the way in which those requirements are satisfied.

*Implications*

Individual contractors or business channels will not be able to opt out of deploying the enterprise architecture without presenting a compelling and rational reason for securing such a waiver.

There will be a governance process in place to establish and enforce compliance with the enterprise architecture.

There will need to be a charge-back mechanism in place to fund IT infrastructure.

Support people will need to have deep skills in standard products and solutions.  SFA and its contractors must train current staff or acquire skills from outside to meet these needs and enforce these standards.

*Architectural Impact:* The architecture must be flexible enough to allow infrastructure alterations.

Existing systems which do not adhere to the new infrastructure must be evaluated in light of the emerging technologies.  Decisions to either waiver or sunset these systems must be made in conjunction with developing the architecture.

## Guiding Principle

SFA will fund at the enterprise level those applications that support multiple lines of business, rather than building custom solutions for each specific need.
*Significance*

Each line of business will not have the autonomy to select its own enterprise applications.

There must be a governance process with the proper authority in place to gain support for and compliance with the chosen enterprise applications.  Waivers to this guiding principal must be given rather than assumed. Any such waiver must have a business justification and be documented in a central architecture library.

*Implications*

Any applications used across business units will be funded at a the enterprise level.

Applications not in compliance with the enterprise direction will be retired on an aggressive implementation schedule.

A technology assimilation process must be in place to identify new technologies that could enable the various facets of SFA's business.

The policy of allowing non-compliant applications/projects under a certain dollar amount may need to be modified to preserve the enterprise view of applications/data.

IT will provide business applications for recognized business problems.

*Architectural Impact*

The architecture must support the enterprise business applications. The architecture will not be required to support individual line of business applications with redundant functionality.

## Guiding Principle

SFA in committed to the utilization of the Virtual Data Center. It is the intention of SFA senior management team to migrate all applications to the VDC in a timely and cost effective manner.

*Significance*

All system migrations to the virtual data center will continue to be executed through a detailed and documented planning strategy.

*Implications*

Existing contractor relationships must be maintained while the role of the virtual data center is incorporated into existing contracts.

Applications under development and planned for future development must be designed with the concept of the VDC in mind.

The VDC should provide more than just cost savings. The fact that SFA system arsenal is in a single virtual cluster should also provide design advantages.

*Architectural Impact*

The architecture must be designed with the role of the VDC in mind.

The ITA also should be a component of the migration strategy of SFA systems to the VDC.

Modifications at the VDC must adhere to the SFA Information Technology Architecture.

In the longer term, the ITA and the role of the VDC should work together to eliminate system redundancies.

## Guiding Principle

SFA must break the cycle of constant application modifications by enforcing planning discipline and setting rigorous release schedules.
*Significance*

The governance process must be robust enough to only allow truly necessary modifications into the release inventory.

Senior management at SFA, through the IRB process and other oversight committees must review each proposed enhancement with the aim of fully understanding its cost/benefit justifications.

Contractors must be given incentives to provide alternative solutions to meet a given business requirements.

SFA senior management must embrace itself for not providing [potentially] beneficial features to its various programs, if the cost of developing those features far outweigh potential benefits and if it does not adhere to the documented long term strategy of SFA.

*Implications* The business will wait for more complete solutions instead of receiving multiple, partial solutions.

Larger changes to systems and to culture will occur, but the cycle of constant change will be broken.

The roll-out of architecture and business applications will be tightly coordinated.

The funding model used to make business decisions will need to include complete cost of development and implementation.

SFA, in conjunction with its partners will need to develop and use an implementation planning process to coordinate these larger releases.

Where possible COTS solutions will be implemented in favor of developing features within existing systems.

*Architectural Impact*

There will be a small number of architecture versions in production at any given time.

To a certain extent, technologies used in the architecture will lag those available in the market.

## 5.9   Conclusion

The long-term vision and the strategic direction of a business are the primary drivers for which applications will be necessary to support the journey from the "As-Is" to the "To-Be" state.  All components of the Information Technology Architecture and particularly the application architecture are thus in existence to support the business vision of the end state.

The business vision associated with SFA may be summarized as one which is based on the utilization of web-based technologies linked to integrated applications which make use of common and rational data stores rather than stove piped systems each keeping its own data and supporting its own unique interface.

The over-arching architecture of future applications should thus avoid "re-inventing" a solution each time SFA business units present the IT organizations (including Legacy contractors) with a functional, legislative or customer based challenge.  Rather, designers of applications, in adherence with documented guiding principles should strive to:

1. Utilize existing data stores at every possible opportunity. SFA owns a wealth of data about its customers, borrowers and trading partners. Systematic solutions, while respecting data integrity, security and privacy regulations, should utilize this data rather than design another database for storage.

2. Parameter driven, open and shared systems. Traditional "hard-coding" practices should be replaced with user controlled parameters. These parameters will allow future applications to be inherently more maintainable and responsive to changes in the business environment.

3. Avoid building solutions unique to a single problem. Many of SFA's requirements either have been documented by other agencies or may be applicable to more than one area of SFA's business model. Few of its requirements call for the design of a custom/one-time solution. The IT organization (including Legacy contractors) should thus constantly strive to research best-in-business and COTS solutions. Thus reducing not only cost, but the application delivery schedule.

4. Strategic, long term alliances with vendors, software development houses and solution providers. These alliances should be effectively used to ensure appropriate cost savings, ongoing integration and an atmosphere of accountability. The success of the team (vendor and SFA) rather than the traditional legacy relationship.

5. SFA is committed to the concept of the Virtual Data Center (VDC). Application development efforts should accept and embrace this concept as a component of all design and construction projects. The VDC offers technology solutions and access to other partner systems, facilitating and supporting the integration of applications at SFA.

The term architecture assumes a certain high level view and inherent discipline within an organization. Discipline not only in the IT organization, but also the business units which are the drivers of application development. An architecture should not be so rigid as to stifle new business thinking. It should support change and in fact provide an environment which supports and encourages it.

However, business units also share responsibility in supporting the architecture. They do so, by establishing clear priorities amongst the variety of potential application development efforts. Business units also should be accountable for providing guidelines and requirements for each application. While system designers should formulate the "How", business units and users should explicitly define the "What".

This change in culture and shared responsibility is of paramount importance in not only defining an architecture for future applications at SFA, but adopting it and maintaining it on an ongoing basis through the journey from the "As-is" to the "To-Be".